be rotated outwardly to provide a maximum nozzle area, thus accommodating the increased airflow through the bypass duct **26.** This may be accomplished by opening the air valve **70** so as to permit the pressurized airflow within the inflatable bladder **42** to escape overboard. Deflation of the bladder **42** in turn permits the actuating ring section **46** to translate upstream within the inner and outer wall members **34, 35** of the unison ring **33.** The actuating ring section **46** is translated upstream by the forward ends, shown generally at **72,** of the hinged nozzle flaps **32** which sealingly engage the abutment face **52** of the circumferential flange **50.** The individual nozzle flaps **32** are pivoted radially outward about the pins **36** as a direct consequence of the differential air pressure existing between the pressurized airflow in the bypass duct **26** and the ambient airflow outside the cowling **24.** As becomes immediately obvious, deflation of the bladder **42** removes any resisting force to outward rotation of the nozzle flaps **32** as would otherwise be provided by engagement of the abutment face **52** with the upstream ends **72** of the nozzle flaps **32.** However, as is also readily apparent, an ultimate limit to the outward rotation of the nozzle flaps **32** is provided by the aft abutment face **60** of the annular ring section **54** which sealingly engages the upstream end **72** of the nozzle flaps **32.**

Referring back to FIG. **2,** there is shown the mode of operation generally assumed during the cruise mode of operation when the airflow through the bypass duct **26** is reduced. The reduced airflow requires that the nozzle flaps **32** be pivoted radially inward to establish a minimum nozzle area, thus maintaining the required forward propulsive thrust. The nozzle flaps **32** may be rotated into the closed position by inflating the bladder **42** with a pressurized airflow controlled by the air valve **70** and furnished by way of the air hose **68** as shown in FIG. **4.** Inflation of the bladder **42** operates to translate the ring section **46** rearwardly between the inner and outer wall members **34, 35** of the unison ring **33.** Downstream translation of the ring section **46** in turn results in the abutment face **52** of the circumferential flange **50** sealingly engaging the upstream ends **72** of the nozzle flaps **32** so as to rotate the nozzle flaps radially inward about the pins **36.** In this manner, the nozzle flaps **32** are forced to pivot radially inward despite the differential pressure existing between the pressurized airflow in the bypass duct **26** and the ambient airflow outside the cowling **24.** As becomes readily apparent, ultimate rotation of the nozzle flaps **32** radially inward is determined by the forward abutment face **58** of the ring section **54** which engages the aft side of the ring section **46,** terminating rearward translation thereof.

Referring now to FIG. **5,** there is shown the mode of operation which may be assumed during landing when the pitch of the fan blades is varied into reverse pitch for braking the associated aircraft. During reverse pitch, the airflow in the bypass duct **26** changes direction whereupon the airflow enters the annulus defined between the rearward end of the cowling **24** and the casing **20** of the core engine **16.** The actuator **64** is operated so as to extend the actuator piston drive rod **65** in a rearward direction. An annular space **74** thereupon opens between the generally convex downstream end **40** of the forward fixed portion **28** of the cowling and the generally concave upstream end **38** of the unison ring **33.** The annular opening **74** permits an increased amount of air to enter the bypass duct **26** in a reverse direction so that adequate air is readily available for ingestion by the compressor, via the inlet **27,** and also so that the air passing forwardly along the bypass duct to the fan is less restricted, thereby improving the reverse thrust capability of the variable pitch fan. Whereas the inflatable bladder is disconnected from the air inlet **66** upon rearward translation of the unison ring **33,** there is no force exerted on the upstream ends **72** of the nozzle flaps **32,** thereby permitting them to rotate in accordance with the differential air pressures on either side of the flaps. In this manner, increased airflow is admitted to the bypass duct **26** with decreased aerodynamic losses for improved performance efficiency during the reverse thrust mode of operation.

Referring now to FIGS. **6** and **7,** there is shown an alternate arrangement for the variable portion of the cowling whereby the cowling may be split in a manner which permits lowering of the core engine **16** for ease of repair and maintenance. The variable portion of the cowling includes a unison ring **33'** split into two arcuate sections **72, 74** which respectively retain arcuate bladder sections **76, 78.** Two adjacent ends of the arcuate unison ring sections **72,**, **74** are rotatably pinned to **102, 102'** by respective clevises **100, 100'** to the opposing ends of an axle rod **80** which is disposed for axial translation relative to the pylon **14.** Inner bearing rings or races **82, 82'** are respectively fastened in a conventional manner to opposing ends of the axle rod **80** wherein the bearing rings **82, 82'** are also respectively disposed for rotation relative to outer bearing rings or races **84, 84'** by circumferentially spaced apart rollers **86, 86'.** The outer bearing rings **84, 84'** are disposed for respective rotation in an axial direction along two spaced apart parallel inner tracks **88, 88'** each of which is fixedly connected at opposing ends to the pylon **14.** A pair of parallel outer guide tracks **90, 90'** also connect to the pylon **14** and respectively engage the outer bearing rings **84, 84'** for longitudinal guidance thereof. As becomes readily apparent the unison ring **33'** is suitably disposed for axial translation in the aforementioned manner as may be accomplished by the linear actuator **64** interconnecting drive rod **65.** In addition the arcuate sections **72, 74** may be swung apart about the pins **102, 102'** permitting the core engine **16** to be lowered for ease of repair and maintenance.

Although the invention as herein described is in relation to a front fan high bypass ratio engine, it is also equally applicable to all types of fan powerplants regardless of bypass ratio or location of the fan. In addition, although the fan cowling has not been described as extending completely back to the rear of the core engine, it is readily apparent that the invention is equally applicable to such an installation. Therefore, having described a preferred embodiment of the invention, though not exhaustive of all possible equivalents, what is desired to be secured by letters patent is claimed below.

What is claimed is:

1. A fan cowling for a gas turbofan engine said cowling being spaced apart from a core engine to define an annular bypass duct therebetween and comprising:
   - a forward fixed portion;
   - an aft variable portion including a unison ring in axial alignment with the fixed portion;
   - a plurality of circumferentially spaced apart nozzle flaps disposed to be freely rotatable between limit stops around the aft end of the unison ring such